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(72) Inventors; and (75) Inventors/Applicants (for US only): FRISTENSKY, Brian [CA/CA]; 55 Maplefidge Avenue, Winnipeg, Manitoba R3T 4X6 (CA); WANG, Yaping [CN/CA]; 513-26 Gaylene Place, Winnipeg, Manitoba R3T 4G7 (CA).		Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.	
(74) Agent: ADE & COMPANY; 1700-360 Main Street, Winnipeg, Manitoba R3C 3Z3 (CA).		(88) Date of publication of the international search report: 24 February 2000 (24.02.00)	
(54) Title: METHOD FOR GENETIC ENGINEERING OF DISEASE RESISTANCE USING THE DRR206 CLASS OF PROTEINS			
(57) Abstract <p>To identify genes effective against the blackleg fungus <i>Leptosphaeria maculans</i>, we have transformed canola (<i>Brassica napus</i> with four pea (<i>Pisum sativum</i>) genes under constitutive control by the CaMV 35S promoter: PR10.1, chitinase, DRR206 and defensin. Transgenic lines containing single copy T-DNA insertions for each gene were screened for both seedling (cotyledonary) and adult plant resistance. Lines for which pea DRR206 or defensin mRNA was expressed also showed decreased disease scores when inoculated with <i>L. maculans</i> or <i>Sclerotinia sclerotiorum</i>, compared to non-expressing transgenic lines. For PR10 and chitinase transgenics, there was little or no enhancement of resistance. Furthermore, resistance to <i>L. maculans</i> co-segregated with DRR206 and defensin transgenes. Extracts from DRR206 and defensin transgenic plants inhibited fungal growth in-vitro. DRR206 transgenic plants also demonstrated decreased hyphal growth at inoculation sites, and evidence of a hypersensitive response.</p>			

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00608

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/29 C12N15/82 C12N5/10 A01H5/00 A01N65/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N A01H A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE BIOSIS 'Online! BIOSCIENCES INFORMATION SERVICE, PHILADELPHIA, PA, US AN 1999:33133, WANG, Y., ET AL.: "Expression of native and constitutively-expressed pea defense genes in transgenic plants" XP002125573 abstract & CANADIAN JOURNAL OF PLANT PATHOLOGY, (MARCH, 1988) VOL. 20, NO.1, PP131. MEETING INFO: ANNUAL MEETING OF THE CANADIAN PHYTOPATHOLOGICAL SOCIETY WINNIPEG, MANITOBA, CANADA JULY 1997, --- -/--</p>	<p>1-4, 7-14, 17-33</p>

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

15 December 1999

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00608

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>CULLEY, DAVID E. ET AL: "Molecular characterization of disease-resistance response gene DRR206 -d from Pisum sativum (L.)"</p> <p>PLANT PHYSIOL. (1995), 107(1), 301-2 , XP002125565</p> <p>the whole document</p> <p>-& CULLEY, D.E., ET AL.: "Pisum sativum disease resistance response protein 206-d (DRR206-d) gene, complete cds"</p> <p>EMBL ACCESSION NO: U11716,</p> <p>15 July 1994 (1994-07-15), XP002125566</p> <p style="text-align: center;">---</p>	1-4,7,8,10
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X	<p>WO 98 26083 A (MONSANTO CO)</p> <p>18 June 1998 (1998-06-18)</p> <p>figure 1; example 5</p> <p style="text-align: center;">---</p>	11-20
X	<p>WO 93 05153 A (ICI PLC)</p> <p>18 March 1993 (1993-03-18)</p> <p>page 5, line 20 -page 6, line 11; claim 36; figure 30</p> <p style="text-align: center;">---</p>	11-20
P,X	<p>DATABASE SCISEARCH 'Online!</p> <p>AN 1999:318267,</p> <p>WANG, Y.P., ET AL.: "Constitutive expression of pea defense gene DRR206 confers resistance to blackleg (Leptosphaeria maculans) disease in transgenic canola (Brassica napus)"</p> <p>XP002125574</p> <p>abstract</p> <p>& MOLECULAR PLANT-MICROBE INTERACTIONS, vol. 12, no. 5, May 1999 (1999-05), pages 410-418,</p> <p>-& WANG, Y., ET AL.: "Pisum sativum pathogenesis-related protein (DRR206-c) gene, complete cds"</p> <p>EMBL ACCESSION NO: AF115574,</p> <p>20 April 1999 (1999-04-20), XP002125567</p> <p style="text-align: center;">---</p>	1-33
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 99/00608

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 97 41237 A (KAZAN KEMAL ;COOPERATIVE RESEARCH CENTRE FO (AU); GOULTER KENNETH) 6 November 1997 (1997-11-06)</p> <p>example 5</p>	<p>2,9,12, 19,22, 26, 29-31,33</p>
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A	<p>CHIANG CH C ET AL: "THE FUSARIUM SOLANI-INDUCED EXPRESSION OF A PEA GENE FAMILY ENCODING HIGH CYSTEINE CONTENT PROTEINS" MOLECULAR PLANT-MICROBE INTERACTIONS, vol. 4, no. 4, 1991, page 324-331 XP002063334 ISSN: 0894-0282 the whole document</p>	<p>11</p>
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Information on patent family members

Inte: onal Application No

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